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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,046	02/26/2004	Shinichi Takeshima	118849	5174

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EXAMINER	
WARTALOWICZ, PAUL A	
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1754	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/786,046	TAKESHIMA, SHINICHI	
	Examiner	Art Unit	
	Paul A. Wartalowicz	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Arguments

Applicant's arguments filed 11/6/06 have been fully considered but they are not persuasive.

Applicant argues that Nawa does not disclose a microemulsion and that the particle size of a microemulsion is very fine (few nanometers to a few tens of nanometers) whereas particles in an emulsion system may measure 1 micrometer or more.

However, Nawa discloses particle sizes in the range of 1 micrometer or *less*. Therefore, the particle size cannot be used to determine whether or not a microemulsion occurs. That Nawa discloses particle sizes less than 1 micrometer encompass the range of a few nanometers to a few tens of nanometers that would be indicative of a microemulsion.

The disclosure of Nawa allows for bulk ceramics *and* fine metal compound oxide particles. The limitation of metal oxide particles having a composition uniform in the atomic level is a feature not claimed. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., metal oxide particles having a composition uniform in the atomic level) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues that Nawa does not suggest the use of a surfactant.

However, Nawa is not relied upon to teach the limitation of the surfactant. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that Sherif does not remedy the deficiency in Nawa because Sherif is only relied to teach that it would have been obvious to use zirconium alkoxide instead of titanium alkoxide and that Sherif nowhere discloses the desirability of a microemulsion or surfactant in the Nawa process.

However, Sherif teach a process for the formation of metal oxides from corresponding metal alkoxide by a hydrolysis reaction (col. 1, lines 9-11) wherein a surfactant is added to a solution comprising metal alkoxide for the purpose of forming an emulsion (Throughout document, particularly col. 2, lines 15-20).

Chittofrati et al. teach a method of making mixed metal oxides (col. 1) wherein a microemulsion is formed by contacting an organic solvent with an organic salt disposed therein with an aqueous solvent with an aqueous salt therein in the presence of a surfactant (col. 3-4).

Therefore, the combined teaching of the prior art meet the limitations of the present invention in that it is obvious to contact an organic phase with an aqueous

phase, each with respective soluble salts therein, in the presence of a surfactant as taught by Chittofrati et al.

Applicant argues that Uenishi does not remedy the deficiencies of Nawa and Sherif.

However, Uenishi et al. is only relied upon to teach that it is known to use mixed oxides of zirconium and cerium as catalysts. Uenishi is not relied upon to teach the use of surfactant. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claim Objections

Claim 3 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 requires a microemulsion. Claim 3, however, recites wherein "a water-in-oil type emulsion system or microemulsion system is used." This appears to infer that a microemulsion is not necessarily required in claim 1 even though claim specifically recites a microemulsion at line 5.

Clarification and/or correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Chittofrati et al. (U.S. 5670088).

Chittofrati et al. teach a method of making mixed metal oxides (col. 1) wherein a microemulsion, having dimensions of less than 10 nm (col. 3), is formed by contacting an organic solvent with an organic salt disposed therein with an aqueous solvent with multiple aqueous salts therein in the presence of a surfactant (col. 3-4) and calcining the product (col. 4).

As to the limitations of the compound oxide particles having a composition that is uniform at the atomic level, Chittofrati et al. teach a substantially similar process such that the properties of the product of said process are substantially similar to those of the product of the present invention.

As to the limitation wherein the hydroxide of the organic compound is produced by a hydrolysis reaction of the organic compound at the interface between the organic and aqueous phases, it appears that the instantly claimed product by process is the same as that which is claimed (hydroxide). Additionally, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct and not the examiner to

show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessman*, 180 USPQ 324.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nawa et al. (U.S. 5863850) in view of Sherif (U.S. 5023071) and Chittofrati et al. (U.S. 5670088).

Nawa et al. teach a process for making a zirconia based ceramic material (col. 1, lines 10-12) comprising the mixed oxide of cerium, titanium, and zirconium (col. 5, lines 63-66) wherein an aqueous solution of zirconium and cerium salts is mixed with an organic solution of an alkoxide of titanium to obtain a mixed solution (col. 6, lines 40-44) wherein the mixed solution is hydrolyzed to generate a precipitate (col. 6, lines 44-45)

and then heated at a temperature of 800°C (col. 6, lines 34-36). This disclosure meets the limitation wherein a water-in-oil emulsion system or microemulsion system is used due to the explanation that mixing an organic phase with an aqueous phase will necessarily result in a water-in-oil type emulsion or microemulsion. As to the limitation wherein the size of the aqueous phase of the water-in-oil type microemulsion is in the range of 2-40 nm, Nawa et al. teach the process limitations of the claimed invention such that Nawa et al. inherently teach wherein the size of the aqueous phase of the water-in-oil type emulsion is in the range of 2-40 nm.

Nawa fails to teach the aqueous phase emulsified in the organic phase with a surfactant. Nawa et al. also fail to teach wherein said organic phase having dissolved therein a zirconium alkoxide, wherein conducting said organic phase with said aqueous phase to produce a product of zirconium hydroxide by hydrolysis reaction of the zirconium alkoxide at their interface between said organic and aqueous phases while incorporating the zirconium element in the product.

Sherif, however, teaches a process for the formation of metal oxides from corresponding metal alkoxide by a hydrolysis reaction (col. 1, lines 9-11) wherein a surfactant is added to a solution comprising metal alkoxide for the purpose of forming an emulsion (Throughout document, particularly col. 2, lines 15-20).

Chittofrati et al. teach a method of making mixed metal oxides (col. 1) wherein a microemulsion is formed by contacting an organic solvent with an organic salt disposed therein with an aqueous solvent with an aqueous salt therein in the presence of a surfactant (col. 3-4).

Therefore, it would have been obvious to contact an organic phase with an aqueous phase, each with respective soluble salts therein, in the presence of a surfactant as taught by Chittofrati et al.

Thus, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide adding a surfactant to a solution comprising metal alkoxide for the purpose of forming an emulsion (Throughout document, particularly col. 2, lines 15-20) in a substantially similar process of forming metal oxides from corresponding metal alkoxide by a hydrolysis reaction (col. 1, lines 9-11) as taught by Sherif and Chittofrati et al.

Additionally, Sherif teaches a process for the formation of metal oxides from corresponding metal alkoxide by a hydrolysis reaction (col. 1, lines 9-11) wherein the process of initiating the hydrolysis of an alkoxide to form a metal oxide is applicable to alkoxides of titanium or zirconium (col. 1, lines 60-65) for the purpose of forming metal oxide powders having better flow and density (col. 1, lines 55-58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein the process of initiating the hydrolysis of an alkoxide to form a metal oxide is applicable to alkoxides of titanium or zirconium (col. 1, lines 60-65) for the purpose of forming metal oxide powders having better flow and density (col. 1, lines 55-58) such that zirconium alkoxide is substituted for titanium alkoxide as taught by Sherif.

As to the limitations of the compound oxide particles having a composition that is uniform at the atomic level, the combined prior art teach a substantially similar process

such that the properties of the product of said process are substantially similar to those of the product of the present invention.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chittofrati et al. (U.S. 5670088) in view of Sherif (U.S. 5023071).

Chittofrati et al. teach a method of making inorganic metal oxides as described above in claim 1.

Chittofrati et al. fail to teach wherein the organic compound is a metal alkoxide or an acetonate-metal complex.

Sherif, however, teaches a process for the formation of metal oxides from corresponding metal alkoxide by a hydrolysis reaction (col. 1, lines 9-11) for the purpose of providing for a hydrolysis reaction initiated by addition of an aqueous solution (col. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide metal alkoxide in Chittofrati et al. in order to provide for a hydrolysis reaction initiated by addition of an aqueous solution (col. 2) as taught by Sherif.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chittofrati et al. (U.S. 5670088) in view of Sherif (U.S. 5023071) and Nawa et al. (U.S. 5863850).

Chittofrati et al. teach a method of making mixed metal oxides (col. 1) wherein a microemulsion, having dimensions of less than 10 nm (col. 3), is formed by contacting an organic solvent with an organic salt disposed therein with an aqueous solvent with

multiple aqueous salts therein in the presence of a surfactant (col. 3-4) and calcining the product (col. 4).

Chittofrati et al. fail to teach wherein the organic compound is a metal alkoxide or an acetonate-metal complex.

Sherif, however, teaches a process for the formation of metal oxides from corresponding metal alkoxide by a hydrolysis reaction (col. 1, lines 9-11) for the purpose of providing for a hydrolysis reaction initiated by addition of an aqueous solution (col. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide metal alkoxide in Chittofrati et al. in order to provide for a hydrolysis reaction initiated by addition of an aqueous solution (col. 2) as taught by Sherif.

Additionally, Chittofrati et al. fail to teach that the alkoxide is zirconium alkoxide and that the aqueous phase contains a cerium salt.

Nawa, however, teach a method for making inorganic oxides (col. 1) comprising zirconium and cerium salts are mixed with an alkoxide (col. 6).

Sherif teaches a process for the formation of metal oxides from corresponding metal alkoxide by a hydrolysis reaction (col. 1, lines 9-11) wherein the process of initiating the hydrolysis of an alkoxide to form a metal oxide is applicable to alkoxides of titanium or zirconium (col. 1, lines 60-65) for the purpose of forming metal oxide powders having better flow and density (col. 1, lines 55-58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide zirconium alkoxide and a cerium

inorganic salt in Chittofrati et al. because it is known produce oxides using these starting materials in substantially similar processes as taught by Nawa and Sherif.

Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chittofrati et al. (U.S. 5670088) in view of Uenishi et al. (U.S. 20020061816).

Chittofrati et al. teach a process for making a compound oxide particle according to claims 1-4.

If the teaching in Chittofrati et al. does not teach the limitations in claims 7-10; Uenishi et al., however, teach a process for purifying exhaust (paragraph 0004, lines 1-5) wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5) as taught by Uenishi et al.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chittofrati et al. (U.S. 5670088) in view of Sherif (U.S. 5023071) and Uenishi et al. (U.S. 20020061816).

Chittofrati et al. teach a process for making a compound oxide particle according to claims 1-4.

If the teaching in Chittofrati et al. does not teach the limitations in claims 7-10; Uenishi et al., however, teach a process for purifying exhaust (paragraph 0004, lines 1-5) wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5) as taught by Uenishi et al.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chittofrati et al. (U.S. 5670088) in view of Sherif (U.S. 5023071) and Nawa et al. (U.S. 5863850) and Uenishi et al. (U.S. 20020061816).

Chittofrati et al. teach a process for making a compound oxide particle according to claims 1-4.

If the teaching in Chittofrati et al. does not teach the limitations in claims 7-10; Uenishi et al., however, teach a process for purifying exhaust (paragraph 0004, lines 1-5) wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5) as taught by Uenishi et al.

Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nawa et al. (U.S. 5863850) in view of Chittofrati et al. (U.S. 5670088) and Sherif (U.S. 5023071) and Uenishi et al. (U.S. 20020061816).

Nawa et al. teach a process for making a zirconia based ceramic material as described above in claim 1. The combined teachings of Nawa et al. and Sherif meet the claimed limitation wherein a process for production of an exhaust gas purification catalyst carrier by a production process such that characteristics of the product are inherently taught because the limitations of the process of making are disclosed. If

Nawa et al. fail to teach wherein a process for production of an exhaust gas purification catalyst carrier by a production process, Uenishi et al., however, teach a process for purifying exhaust (paragraph 0004, lines 1-5) wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5) as taught by Uenishi et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Wartalowicz whose telephone number is (571) 272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz
September 6, 2007

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